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77. METAL WORKING,
Drilling Machines.

36.

A.D. 1854 . . . . N° 308.

Drilling Machine.

LETTERS PATENT to John Perry, of Leeds, in the County of York, Machinist, for the Invention of "An Improved Drilling Machine."

Sealed the 8th August 1854, and dated the 9th February 1854.

PROVISIONAL SPECIFICATION left by the said John Perry at the Office of the Commissioners of Patents, with his Petition, on the 9th February 1854.

I, John Perry, of Bradford, in the County of York, Machinist, do hereby declare the nature of the said Invention for "An Improved Drilling Machine" to be as follows:—

This Invention relates to a new and improved arrangement of mechanism or apparatus, designed principally for the purpose of drilling holes in the circular combs used in wool combing machinery, wherein the teeth or "brooches" (as they are technically termed) are inserted in manufacturing or constructing such combs; but this Invention is also applicable for other drilling purposes where a series of holes are required to be drilled in a circular direction equidistant from each other. The improved drilling machine consists of the following arrangement of parts:—Firstly, a circular face plate or wheel capable of revolving upon a horizontal axis and furnished with radial slots, by means of which the circular comb bar (or piece of metal in which the holes are to be drilled) is to be affixed thereto. Around the circumference of this wheel or plate a worm wheel is cut or otherwise formed, in gear with which is a worm, which is actuated when required by means of a small winch handle, the movement of which is transmitted to the worm by a train of spur gearing. In connection with the said winch handle is a small disc having a notch or notches cut in its periphery, into which the end of a spring falls as the disc revolves.

The drill is mounted in a revolving socket placed and capable of sliding in an horizontal direction, being brought forward to its work by means of a small lever, and withdrawn by a spring.

The slide carrying the drill is capable also of being adjusted in a vertical direction by means of a screw. The method of using the improved drilling machine is as follows:—The circular comb bar or other piece of metal in which the holes are to be drilled is attached to the face plate or wheel, in a concentric position, and secured thereto by means of bolts or clamps. The drill slide is then adjusted by means of the screw to the required height, according to the diameter of the circle. The drill (which is revolving rapidly) is then brought forward by means of the lever, and the first hole drilled. As soon as the drill is withdrawn, the workman turns the winch handle untill he feels the spring drop into one of the notches in the small disc. This will have the effect of turning the face plate and comb bar a small portion of a revolution. The workman then brings the drill forward and drills another hole, and so on, until the circle is complete. By this means the distance between each of the holes is divided in an expeditious and accurate manner, and perfect uniformity and regularity ensured. The relative number of holes drilled in any given circumference of circle can be varied at pleasure by changing the relative proportions of the spur wheels which communicate motion from the notched disc to the worm, which actuates the face plate or wheel.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said John Perry in the Great Seal Patent Office on the 9th August 1854.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, John Perry, of Leeds, in the County of York, Machinist, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Ninth day of February, in the year of our Lord One thousand eight hundred and fifty-four, in the seventeenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Perry, Her special licence that I, the said John Perry, my executors, administrators, and assigns, or such others as I, the said John Perry, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "AN IMPROVED DRILLING MACHINE," upon the condition (amongst others) that I, the said John Perry, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said John Perry, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof (that is to say):—

My Invention of an improved drilling machine, relates to a certain novel and improved arrangement of mechanism or apparatus, designed principally for the purpose of drilling holes in circular or cylindrical combs used in machinery employed for combing wool or other fibrous material, wherein the teeth or "brooches" (as they are technically termed) are inserted in manufacturing or constructing such combs; but my Invention is also applicable for other drilling purposes where a series of holes are required to be drilled in a circular direction and equidistant from each other, whether such holes are drilled in a direction parallel or at right angles to the axis of such circle. My improved drilling machine consists of the following arrangement of parts. Firstly, when it is required to drill a series of holes round a circular comb bar in a direction parallel to the axis of the said circle, I employ a circular face plate or wheel capable of revolving upon an horizontal axis and furnished with radial slots, by means of which the comb bar (or other circular piece of metal in which the holes are to be drilled) is to be affixed thereto. Around the circumference of this wheel or plate a worm wheel is cut or otherwise formed, in gear with which is a worm or screw, which is actuated, when required, by means of a small winch handle, the movement of which is transmitted to the worm by means of a train of spur wheels. In connection with the said winch handle is a small disc, having a notch or notches cut in its periphery, into which the end of a spring falls as the said disc revolves. The drill is mounted in a revolving socket, placed and capable of sliding in an horizontal direction, being brought forward to its work by means of a small lever, and withdrawn by a spring. The slide carrying the drill is capable also of being adjusted in a vertical direction by means of a screw. When it is required to drill the holes at right angles to the axis of the circle, that is, in a radial direction, a slight modification of the above machine is necessary. A maundril or arbor is mounted in suitable bearings attached to the framing of the apparatus. Upon this maundril the cylinder to be drilled is keyed; one end of the maundril is furnished with a toothed wheel, the number of teeth in which corresponds to the number of rows of holes required to be drilled. The drill is mounted and driven in a similar manner to the preceding, except that the vertical adjustment is dispensed with, the drill being always upon a level with the centre of the maundril. The drill carriage is also capable of sliding in a lateral direction, being actuated by a spur pinion travelling upon a rack fixed to the bed of the machine, the spur pinion being moved by means of a ratchet lever and wheel, the number of holes per inch being regulated by the number of teeth in the said wheel. But in order more fully to ascertain the manner of carrying my said Invention into practical effect, and to explain the construction thereof more fully and in detail, I have annexed hereunto a sheet of illustrative Drawings, and have marked the same with figures and letters of reference, corresponding with those in the following explanation thereof, similar letters of reference being placed upon corresponding parts of the mechanism in all the Figures, in so far as such parts appear or can be seen at each of the said Figures respectively.

Figure 1, in the annexed Drawing, represents a front elevation of my improved drilling machine, as arranged for drilling holes around a circular comb bar, such holes running in a direction parallel to the axis of such circle, and Figure 2 is a side elevation of the same. *a, a,* represents the face plate or wheel, mounted and capable of revolving in suitable bearings in the framework *b, b.* This face plate *a, a,* is provided with radial slots *c, c,* and furnished with adjustable clips or clamps *d, d,* by means of which the circular comb bar *e, e,* to be drilled, is adjusted in a concentric position and fixed to the face plate. Around the circumference of the face plate *a, a,* a worm wheel is cut, (see Figure 2) which gears with a worm *f, f,* fixed upon a spindle *g, g*; *h, h,* is the winch handle for turning the worm *f, f,* when required, the movement being transmitted by means of the train of spur gearing *i, i.* Upon one end o. the spindle to which the winch handle *h, h,* is applied, a disc *k, k,* is fixed this disc *k* having a notch or notches cut in its periphery, into which the end of the spring *l, l,* falls as the disc revolves.

The drill *m, m,* is carried in a socket *n, n,* which is caused to revolve by means of a band *o, o,* passing around a pulley. The drill carriage *p, p,* is capable of sliding in an horizontal direction to and fro, from the comb bar being brought forward by means of the lever *q, q,* and withdrawn by a spring (not seen in the Drawing). The slide which carries the drill carriage is also capable of being adjusted in a vertical direction by turning a screw by means of the winch handle *r, r,* according to the number and diameter of the rows of holes, the same being accurately marked in the index plate *s, s.* The method of using this improved drilling machine is as follows :—The circular comb bar *e, e,* being adjusted in a concentric position, as regards the face plate, is secured thereto by the clamps *d, d.* The drill carriage slide is then adjusted by the winch handle *r, r,* to the required height, according to the diameter of the circle. The drill *m* (which is revolving rapidly) is then brought forward by means of the lever *q, q,* and the first hole drilled. As soon as the drill is withdrawn, the workman turns the winch handle *h, h,* until he feels the end of the spring *l, l,* drop into one of the notches in the disc *k, k,* which by means of the spur gearing *i, i,* and worm *f, f,* will cause the face plate *a, a,* and with it the comb bar *c, e,* to turn a small portion of a revolution. The workman then again brings the drill forward, and drills another hole, and so on, until the circle is complete. By this means it will be seen that the distance between each of the holes is divided in an expeditious and accurate manner, and perfect uniformity and regularity ensured. The relative number of holes drilled in any given diameter of circle may be varied at pleasure by changing the relative proportions of the spur wheels *i, i,* which communicate motion from the notched disc *k, k,* to the worm *f, f.* Figure 3 is a front elevation; and Figure 4, an end view, shewing the arrangement of my improved drilling machine when employed for drilling holes around a cylinder, such holes being drilled in a direction at right angles to the axis of the said cylinder. *a, a,* is the maundril, being mounted in suitable bearings *b, b,* and having keyed upon one end a spur wheel *c, c,* furnished with a catch *d, d,* for holding the same. The cylinder *e, e,* to be drilled is keyed upon the maundril *a, a,* and is turned round by hand by means of the wheel *c, c,* as required. The drill *m, m,* is placed in a socket *n, n,* caused to revolve by means of a belt *o, o,* and is capable of sliding backwards and forwards in its bearings in the drill carriage *p, p,* being brought forward by means of the handle or lever *q, q,* and withdrawn by means of the spring *r, r*; *f, f,* is a rack fixed to the bed *g, g,* of the machine, upon which the drill carriage *p, p,* slides; *h, h,* is a ratchet wheel keyed upon a spindle *i, i,* to the other end of which a spur wheel *k, k,* which gears into the rack *f, f,* is fixed. The wheel *h* is provided also with a ratchet lever *j, j,* and pall *l, l.* The method of using this arrangement of my improved drilling machine is as follows:—The cylinder *e, e,* being adjusted, is held and prevented from revolving by means of the catch *d, d*; the drill *m*, being also adjusted, is held by the catch *l, l*; the drill *m* is then brought forward by means of the handle *q*, and the first hole drilled. As soon as the drill is withdrawn, the drill carriage is moved longitudinally by turning the wheel *h, h,* a portion of a revolution by means of the lever *j, j,* and another hole drilled, and so on until the row is finished; the catch *d, d,* being then released, the cylinder *e, e,* is turned a portion of a revolution, and another row of holes drilled. The number of holes in a row is regulated by means of the wheel *h, h,* and the number of rows in the circumference of the cylinder *e, e,* by means of the wheel *c, c.*

Having thus described the nature and object of my said Invention of an improved drilling machine, together with the best means I am acquainted with for carrying the same into practical effect, I would remark, in conclusion, that I claim as my Invention the general construction and arrangement of drilling machine, or any modification thereof, to be employed for the aforesaid purposes, as exhibited in the annexed Drawings and above more particularly described.

In witness whereof, I, the said John Perry, have hereunto set my hand and seal, this Seventh day of August, in the year of our Lord One thousand eight hundred and fifty-four.

JOHN PERRY. (L.S.)

Witness,
John Brown,
Hunslet, n^r Leeds.

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